MASSACHUSETTS
LIBRARIES
INSTITUTE of TECHNOLOGY

Digitized by the Internet Archive
in 2011 with funding from
Boston Library Consortium Member Libraries

http://www.archive.org/details/whydidwestextend00acem

DEWEY

HB31
.M415
no.96-32

(19)

working paper
department
of economics

WHY DID THE WEST EXTEND THE FRANCHISE? INEQUALITY AND GROWTH IN HISTORICAL PERSPECTIVE

Daron Acemoglu

96-32 October, 1996

massachusetts
institute of
technology

50 memorial drive
cambridge, mass. 02139

WHY DID THE WEST EXTEND THE FRANCHISE? INEQUALITY AND GROWTH IN HISTORICAL PERSPECTIVE

Daron Acemoglu

96-32 **October, 1996**

MASSACHUSETTS INSTITUTE
FEB 21 199
LIBRARIES

Why Did the West Extend the Franchise? Democracy, Inequality and Growth in Historical Perspective*

Daron Acemoglu† **James A. Robinson**‡

October 1996

Abstract

During the nineteenth century, most Western societies extended the franchise, and then undertook previously unprecedented redistributive programs. We argue that these political reforms can be viewed as strategic decisions by elites to prevent widespread social unrest and revolution. This account suggests a new view of the origins of redistributive politics, a different explanation for the Kuznets curve, and new links between democracy and growth. We characterize the conditions under which an economy would go through the equilibrium path experienced by Western societies, as opposed to an 'autocratic disaster' with stagnation at a low level of per capita income and high inequality, or an 'East Asian' type of development path with high output, low inequality, but no democracy.

Keywords: Democracy, Enfranchisement, Growth, Inequality, Redistribution, Revolution.

JEL Classification: D72, O15.

---

* We would like to thank Herschel Grossman, Claudia Goldin, Peter Lindert, Peter Temin, Jaume Ventura, Michael Wallerstein and seminar participants at Boston University for helpful comments and suggestions.

† Massachusetts Institute of Technology, Department of Economics, E52-371, Cambridge, MA 02319; e-mail: daron@mit.edu

‡ University of Southern California, Department of Economics, LA, CA 90089; e-mail: jarobins@alnitak.usc.edu.

1 Introduction

The nineteenth century was a period of high growth by historical standards; per capita income in Britain, the leading country, grew by approximately 2% per annum between 1830 and 1870 as opposed to less than 0.3% during the previous century (see Mokyr, 1993). The same period was also an era of fundamental political reform and unprecedented changes in taxation and redistribution; British society was transformed from an 'autocracy' run by an elite to a democracy; the franchise was extended in 1832 then again in 1867 and 1884 to transfer voting rights to portions of society which did not previously have any political representation (see Lee, 1994, Darvall 1934, Briggs, 1959). The decades after the political reforms witnessed radical social reforms, increased taxation and the extension of education to the masses. Finally, as noted by Kuznets, the large increase in inequality which preceded enfranchisement was followed by rapid progress towards more equality: the Gini coefficient for income inequality in England and Wales had risen from 0.400 in 1823 to 0.627 in 1871, and fell to 0.443 in 1901 (see Williamson, 1985, Table 4.2). Two key factors in the reduction in inequality were the increase in the proportion of skilled workers (see Williamson, 1985) and redistribution towards the poorer segments of the society; for instance taxes rose from 8.12% of National Product in 1867 to 18.8% by 1927, and the progressivity of the tax system was increased substantially (see Lindert, 1989).

Similar trends were visible in other countries. While the unique historical origins of the United States have typically been regarded as making it an exception to many generalizations, the struggle towards full democracy was

a protracted one, even after the Civil War (see Crotty, 1977). Moreover, exactly as in Britain, there was the same close relationship between the rise and fall of inequality (which in the US reached its peak around 1930, see Lindert and Williamson, 1980) and the rise of the redistributive state in the early 1930's. Voting rights were also extended to larger segments of the society in Germany, France, Norway, Netherlands, Austria, Finland, Sweden, Belgium and France during the latter part of the nineteenth century (see Rueschemeyer et al. 1992 and Carstairs, 1980). In all of these countries there was also unprecedented redistributive activity, though the exact form and the emphasis on education versus welfare or other forms of transfers varied from country to country (see Flora and Heidenheimer, 1981).

The economics literature has offered a large number of models in which redistribution and growth interact, many explanations for the Kuznets curve, and recently a number of attempts to understand the links between democracy and development. However, the events of the nineteenth century do not conform to any of these models. First of all, existing theories do not model political reform, making it impossible to understand the extension of the franchise which has changed the political and economic landscape radically. Furthermore, even if there is a choice to extend the franchise, it is not clear why it should have been extended, given that this extension led to massive redistribution at the expense of the ruling elites in every society. Therefore, there exists no convincing explanation to date for perhaps the most massive redistribution in history.

In this paper, we offer a theory which provides an explanation for the extension of the franchise, and for the major political and economic trends of the nineteenth century. Our approach is based on two assumptions which we will substantiate using historical evidence in the next section: **(i)** before

industrialization, political power is concentrated in the hands of a rich elite; **(ii)** the masses can attempt a revolution, or at least major social disturbance, and these decisions are at least partly motivated by economic considerations. These two assumptions lead to the following configuration of events: industrialization often starts with the poor unable to accumulate physical or human capital while the rich do, thus inequality worsens. This makes revolution a more attractive option for the masses. In order to prevent social disturbances and revolution the elite is forced to extend the franchise and thereby commit itself to future redistribution. Once the franchise is extended, the masses use their newly acquired political power to enact redistribution in their favor, and inequality is reduced.

This story immediately implies the existence of some alternative development paths: first, growth could occur without increased inequality in which case a revolution never becomes a possibility, and there is no democratization. The precondition for this equilibrium path, which is reminiscent of the economic experiences of South Korea, Taiwan and Singapore, is a relatively equal initial distribution of income so that even the poor segments of society can accumulate (human) capital. Second, the economy may actually converge to a low level steady state before a revolution becomes a serious threat, in which case there is neither democratization nor growth. This case, which we call an 'autocratic disaster', is more likely to happen when initial inequality is high, and interestingly, when the working classes are not well-organized and thus do not pose an effective threat of revolution.

Overall, our analysis not only explains some central political trends but it also sheds light on a number of existing debates:

1. We show that the link between democracy and growth is multi-dimensional.

First, full democratization is the response of elites to political pressure and is therefore often associated with growth and rising inequality. It is this which causes our model to generate the positive relationship between development and democracy found in many cross-country empirical studies (see Przeworski and Limongi, 1993, Helliwell, 1994, and Barro, 1996). Second, the impact of democratization on economic performance is ambiguous. To the extent that it leads to more redistribution to the masses, it encourages human capital accumulation, simultaneously however it may distort the accumulation by capital of other agents (such as the previous elite). Thus, perhaps the lack of robust correlation between democracy and growth should not be surprising.

2. We explain the Kuznets curve, but do not predict that it should be a feature of all development processes (this accords with the findings of Anand and Kanbur, 1993, Fields, 1995 and Fields and Jakubsen, 1993). Instead we predict that a Kuznets curve should be observed when an economy democratizes due to social pressure. This appears to fit the general pattern in the data. Further, although previous research has offered potential rationalizations for the Kuznets curve (e.g. Aghion and Bolton, 1993, Banerjee and Newman, 1996, Galor and Tsiddon, 1996), redistribution from above does not play a role in these theories, and yet in practice, the downturn of the Kuznets curve often takes place after a large increase in redistributive activity (see Lindert, 1989).[1]

3. Our analysis also offers a new interpretation of the cross-country negative correlation between growth and inequality. Previous research has

[1]The finding that democratization leads to reduced inequality is also found in recent cross-country studies, for example, Muller, 1988.

taken either one of two routes: Persson and Tabellini (1994) and Alesina and Rodrik (1994) suggest that more inequality leads to more redistribution thus to lower growth, but this does not appear to accord with cross-country facts as documented by Perotti (1996). In contrast, Saint-Paul (1995) and Bénabou (1996b) suggest that *less* inequality leads to *more* redistribution, but redistribution encourages human capital accumulation and this stimulates growth. This approach however does not conform to the historical experience where the most radical redistributive policies were introduced at times of high inequality. Our theory predicts that the degree of redistribution is non-monotonic and is likely to jump up at times of social unrest which coincide with periods of high inequality[2], and also that redistribution may lead to higher growth. However, our model does not yield a *positive* correlation between inequality and growth (or output) because economies that reach a high level of inequality redistribute enough to reduce inequality significantly in order to prevent social unrest, and thus in the post-war data they appear to have limited inequality (and high output).

4. We also suggest a non-linear relation between political unrest and economic performance whereby the threat of revolution and social unrest may be an effective way of avoiding a poor economic outcome with low income per capita and high inequality. Previous research has emphasized the costs of 'rent-seeking' type activities, or of 'insurrections' (see Bénabou, 1996a for a survey), but the support for these conclusions comes from recent cross-country regressions using only the post-war data. A historical view again suggests that there is more to the story

[2]The empirical relationship between increased income inequality and political instability is indeed strongly positive, see for example Muller and Seligson, 1987.

than a simple negative link between political unrest and growth. In fact, the political unrest which led to redistribution may have been the key to the success of a number of Western countries.

Our paper belongs to the growing literature on political economy and growth. As well as the papers already mentioned, there are a number of important contributions more closely related to our work. First, the possibility of revolution is modelled in an important contribution by Roemer (1985), but he does not relate it to the level of inequality, nor does he discuss how political reform can prevent it. Grossman (1991,1993) models predation by the unprivileged against the rich, and Ades (1995) and Ades and Verdier (1993) investigate a model where there is concentration of political power in the hands of an elite. However, none of these papers note that democratization can occur strategically in order to prevent political unrest, nor do they discuss the redistributive and growth consequences of democratization, although Grossman (1993) analyzes the case of land-reform as the outcome of political pressure. Our paper is also closely related to Galor and Zeira (1993) and Banerjee and Newman (1993) who model investment opportunities as indivisible and thus show that distribution of income matters for growth and development. Finally, our contribution shares a common theme with North and Weingast (1989) who also argue that political reform can be a method of commitment, but in the context of the ascendancy of the English Parliament in the seventeenth century.

The plan of the paper is as follows. The next section gives a brief of overview of some historical evidence that has motivated us and supports our key assumptions and conclusions. Section 3 describes the economic environment. Section 4 characterizes equilibrium dynamics in the absence of the

threat of revolution. Section 5 introduces the possibility of revolution. Section 6 discusses three possible paths of economic and political development. Section 7 briefly discusses some extensions. Section 8 concludes.

2 Historical Perspective

Our theory is partly motivated by historical evidence. Here we will provide a brief overview, emphasizing the evidence in support of the following three features:

1. Inequality was increasing before the extension of the franchise.
2. The franchise was extended as a strategic move to avoid a revolution or at least very costly political unrest.[3]
3. Democratization led to a surge in redistribution, and the increased supply of educated workers caused by this redistribution, and the direct impact of these redistributive efforts were key factors in the reduction in inequality.

Most of our evidence comes from Britain but we will also refer to the historical experiences of other countries. In Britain, the franchise was extended in 1832, and then again in 1867 and 1884 (and later in 1919 and 1928 when women were finally allowed to vote).

2.1 Inequality

Data on income inequality for the nineteenth century are not extremely reliable. However, a number of studies using different data sources on Britain

[3]The discussion pertaining to this point will also establish that before the enfranchisement power was concentrated in the hands of an elite and there was a threat of revolution.

reach the same conclusion. Inequality increased substantially during the first half of the nineteenth century, then started falling in the second half. The turning point appears to be sometime after 1870. This picture is also consistent with the findings of Crafts (1989), and of Lindert (1986) on wealth inequality, but is not completely uncontroversial (see Feinstein, 1988). Table 1 taken from Williamson's (1985) Table 4.2 gives a representative picture:

Table 1 - British Income Inequality

	Share of the Top 10%	Gini Coefficient
1823	47.51	0.400
1830	49.95	0.451
1871	62.29	0.627
1891	57.50	0.550
1901	47.41	0.443
1911	36.43	0.328
1915	36.46	0.333

A similar pattern also emerges from earnings inequality data reported in Williamson (1985) Table 3.2 where the Gini coefficient increases from 0.293 in 1827 to 0.358 in 1851 and falls to 0.331 in 1901.

Another country for which there has been research into inequality trends is the US for which Williamson and Lindert (1980) find a Kuznets curve type relation. Though Goldin and Katz (1995) disagree about the timing, there is no disagreement that at some point inequality increased, and then contracted. The most common view is that the peak of the Kuznets curve came in the early 1930's which are the years when the most redistributive policies in the US history were introduced.[4]

[4]This is however a long-time after universal suffrage. It is important to note that in the

2.2 Franchise Extension and the Threat of Revolution

When introducing the electoral reform to the British parliament in 1831, the prime minister Earl Grey said *"There is no-one more decided against annual parliaments, universal suffrage and the ballot, than am I... The Principal of my reform is to prevent the necessity of revolution...I am reforming to preserve, not to overthrow."* (quoted in Evans, 1983). This view of political reform is shared by modern historians such as Briggs, 1959 and Lee, 1994. For instance, Darvall (1934) writes: *"the major change of the first three decades of the nineteenth century was the reform of Parliament by the 1832 Reform Act, and this was introduced by the Whigs..as a measure to stave off any further threat of revolution by extending the franchise to the middle classes."* In fact, the years preceding the electoral reform were characterized by unprecedented political unrest including the Luddite Riots from 1811-1816, the Spa Fields Riots of 1816, the Peterloo Massacre in 1819, and the Swing Riots of 1830 (see Stevenson, 1979, for an overview).

The reforms that extended political power from a narrow elite to larger sections of the society were immediately viewed as a success not because of some ideal of enlightenment or democracy, but because the threat of revolution and further unrest were avoided (see Lee, 1994). Before the 1832 Reform Act, the total electorate stood at 478,000 out of a population of 24

US, the poorest segments of the society, immigrants, blacks and even poor and illiterate whites, were excluded from the political process (see Williamson, 1960 and Crotty, 1977). Perhaps more importantly, lower middle-class non-immigrant voters saw themselves as highly upwardly mobile (see Kaelble, 1986, Lindert, 1989,1996), and thus their desire for redistribution was different than the lower class British voters. In this respect, 1930's are a turning point: the end of mass immigration and the Great Depression appear to have altered people's perceptions of social mobility, and the level of inequality widened enough so that the costs and benefits of redistribution for the lower middle-class voters are likely to have changed. While we do not incorporate this story into our formal analysis below we feel that it shows the relevance of our results to the US case.

million. Although the Act increased the electorate to 813,000 by reducing the property and wealth restrictions on voting, the majority of British people could not vote. Moreover, the elites still had considerable scope for patronage since 123 constituencies contained less than 1,000 voters (the so-called 'rotten-boroughs'), and there is evidence of serious corruption and intimidation of voters which was not halted in Britain until the Ballot Act of 1872 and the Corrupt and Illegal Practices Act of 1883 which introduced effective secret ballots at elections.

The process of increased representation gained momentum with the Chartist movement during the 1830's and 1840's and leading chartists saw increased representation as the only way to guarantee a more equitable distribution of the gains of growth (see Briggs, 1959). In the meantime, the response of the elite to the Chartist movement was again one of preventing further unrest. For instance, during the 1850's Lord John Russell made several attempts to introduce franchise reform arguing that it was necessary to extend the franchise to the upper levels of the working classes as a means of preventing the revival of political radicalism (Lee, 1994). In discussing the lead up to the 1867 Reform Act, Lee argues that *"as with the first Reform Act, the threat of violence has been seen as a significant factor in forcing the pace; history was repeating itself."* This interpretation is supported by many other historians, for example Trevelyan (1937) and Cowling (1967). The Act was preceded by the founding of the National Reform Union in 1864 and the Reform League in 1865 and the Hyde Park riots of July 1866 provided the most immediate catalyst (see Harrison, 1965). As a result of these reforms, the total electorate was expanded from 1.4 million to 2.52 million and then doubled again by the Reform Act of 1884 (though this represented only 65% of adult males) and the Redistribution Act of 1885 removed many remaining inequalities in

the distribution of seats (see Wright, 1970).

Britain was not alone in responding to political pressure with reform, much the same forces were at work in many other Western societies. For instance, the predecessor of the modern welfare state and social security system were introduced in German by Bismarck as a way of preventing the social democrats gaining further power and enacting more radical reform. Bismarck was from an industrialist background and had very close links to industrial groups. He never denied that it was their interests he had in mind, and frequently emphasized that these reforms would stop the rise of social democracy and socialism. He opposed measures aimed at opening higher education to the poor very rigorously because he thought they would lead further and more radical demands from the working classes (see Baldwin, 1990, Tampke, 1981, and Heidenheimer, 1981, especially p. 281).

2.3 Redistribution

Starting from the end of the nineteenth century, all Western societies experienced increased redistributive activity. Each country followed a different mix of policies and it is not currently understood where exactly these differences came from. For instance, the US and to a lesser extent Canada, achieved much higher primary school enrollment rates than European countries[5] but did not introduce social security provisions nor other direct redistribution measures until well into the twentieth century. Germany, perhaps thanks to its bureaucratic tradition, was able to develop the most far-reaching welfare state at the turn of the century but made no effort to increase schooling among the masses (see Heidenheimer, 1981). Again the salient case for our

[5]This seems to have stemmed primarily from idiosyncratic factors such as from the non-conformist religious backgrounds of many immigrants, see Easterlin (1981).

analysis appears to be Britain which adopted a mixture of direct redistribution and mass education.

The Reform Acts of the 1867-1884 were a turning point in the history of the British state. In 1871 Gladstone reformed the civil service, opening it to public examination and making it meritocratic. Liberal and conservative governments introduced a considerable amount of labor market legislation fundamentally changing the nature of industrial relations in favor of workers. During 1906-1914, the Liberal Party under the leadership of Lloyd George introduced the modern redistributive state into Britain, including health and unemployment insurance, government financed pensions, and a commitment to redistributive taxation. As a result of these fiscal changes, taxes as a proportion of National Product more than doubled in the 30 years following 1870 and then doubled again. In the meantime, taxation also became highly progressive (see Lindert, 1989). Consistent with these trends, Lindert (1994) has recently shown that variables measuring democracy, in particular voter turnout, had a significant positive effect on the expansion of government expenditures on social programs (welfare and unemployment compensation, pensions, health care and housing subsidies) in the period from 1880-1930, again supporting the interpretation that democratization has been a key driving force of the radical shift towards redistributive fiscal and social policy.

Meanwhile the education system which was only open to the elites during most of the nineteenth century also became more and more open to the masses (see Schofield, 1973 and Mitch, 1992 and 1993, on the poor educational standards of the British workforce during the early 1800s). First, school leaving age was set at 11 in 1893, then increased to 12 in 1899 and special provisions for the children of needy families were introduced. Finally, the reform act of 1902 introduced public schooling as a duty of the government

towards its people. As a result of these changes, the proportion of 10-year olds enrolled in school which stood at a disappointing 40% in 1870 increased to 100% in 1900 (see Ringer, 1979, p. 207). Many educational historians argue that the democratization of British society was the key driving force behind these changes (e.g. Simon, 1960).

Williamson (1985) sees the increase in the supply of skills as the key reason for the fall in inequality. Thus to the extent that mass schooling contributed to this increase in the supply of skills, the education policies were a key factor in reducing inequality. This is summed-up by Lindert and Williamson (1985) who write that *"the rate of skill deepening reached impressive levels in the era following the educational reforms of the 1870's, coinciding with the drop down Britain's Kuznets Curve."* They continue; *"The American correlation looks similar, though the turning points come later, well into the 20th century."* Moreover, the data already reported in the previous subsection suggests that the reduction in income inequality was faster than the compression in earnings inequality which is consistent with the view that increased and more progressive taxation, and more transfers to the poor played a key role in reducing inequality.

In the US too, increased schooling seems to have been a crucial factor reducing earnings inequality. The proportion of high school graduates which stood at 4% in 1890 reached 12% in 1930 (Goldin and Katz, 1996, see also Williamson and Lindert, 1980). Further, in line with our approach, Heidenheimer (1981, p. 273) notes that the seven-fold increase in the electorate between 1824 and 1840 was the driving force for the emergence of the common school movement, but notes that *"entitlement remained closely linked to enfranchisement. When the blacks were excluded from voting following the Reconstruction period, Southern countries spent about ten times as much*

per child for teachers' salaries in the white as in the black schools" (see also Goldin, 1994, on the increase in schooling and the role of the government in this process).

Overall, we can summarize our discussion by quoting Easterlin (1981): *"to judge from the historical experience of the world's 25 largest nations, the establishment and expansion of formal schooling has depended in large part on political conditions and ideological influences"* and *"a major commitment to mass education is frequently symptomatic of a major shift in political power and associated ideology in a direction conducive to greater upward mobility for a wider segment of the population."*

3 The Model

3.1 Fundamentals

Consider a non-overlapping generations model with bequests. Time is discrete and runs from zero to infinity. A continuum of agents of mass one live for only one period and each beget a single offspring. There is no population growth. This continuum is initially split into a proportion λ who are "poor" and a proportion $1-\lambda$ who form a rich "elite", only distinguished by the level their endowments. Throughout the paper superscript p will denote poor agent and r will denote rich agent (or member of the elite).We assume that $\lambda > \frac{1}{2}$ so that if there is full democracy and majority voting, the median voter will be a poor agent.

There is a unique consumption good y with price normalized to unity, and a unique accumulable asset, human capital h (which should be thought as a combination of human and physical capital). We begin our analysis of the economy at time zero and assume that for $t < 0$, the economy is in a

steady state with the poor having capital h_0^p and the elite $h_0^r > h_0^p \geq 1$. The starting level of capital in the economy is therefore $H_0 = \lambda h_0^p + (1-\lambda)h_0^r$.

3.1.1 Technology of Production

At time $t = 0$, a new technology (e.g. industrial production) becomes available and will be used for all periods $t \geq 0$. This technology offers two methods of producing the final good. Both production techniques are linear in human capital. The first is a *market* technology:

$$Y_t^m = AH_t^m$$

where H_t^m is the amount of human capital devoted to market production. The second is a *non-market*, "informal", or "home-production" technology:

$$Y_t^h = BH_t^h$$

where H_t^h is the amount of human capital used in home production. Naturally, we have $H_t^h + H_t^m = H_t \equiv \int h_t^i di$. We assume that $A > B$, thus market production is always more productive. The advantage of home production is that it is *not taxable* whereas taxes can be imposed on the market production sector. The only role of home production in our analysis is to guarantee that the equilibrium tax rate will be less than 100%. Finally, we assume that human capital always trades in a perfectly competitive market, thus the (before tax) wage rate per unit of human capital is given as:

$$w_t = A.$$

3.1.2 Preferences

All agents have identical preferences defined over their own consumption and the 'educational bequests' they leave to their offspring (the "joy of giving"

model of bequests). These are represented by a logarithmic utility function:

$$u^i(c_t^i, e_{t+1}^i) = (1-\gamma)\log c_t^i + \gamma \log e_{t+1}^i \quad if\ e_{t+1}^i > 1$$
$$u^i(c_t^i, e_{t+1}^i) = (1-\gamma)\log c_t^i \quad if\ e_{t+1}^i \leq 1$$

for $i = r, p$ and $\gamma \in (0,1)$. Here c_t^i is the consumption of a member of group i alive in period t, and e_{t+1}^i is the investment in the offspring's human capital. Both the consumption and the investment (bequest) decisions are made at the end of the individual's life. The form of the utility function implies that there is a minimum amount of bequest, $e_{t+1}^i = 1$, and when the agent cannot afford this amount, he will leave nothing to his offspring. This non-convexity will capture the feature that when very poor agents will not be able to accumulate assets (see Galor and Zeira, 1993).[6] Throughout the paper we will treat all poor agents as identical, and all members of the elite will also be identical.

The offspring's human capital is given by:

$$h_{t+1}^i = \max\left\{1;\ Z\left(e_{t+1}^i\right)^\beta\right\} \tag{1}$$

where $Z > 1$, and also $\beta < 1$ which will guarantee that accumulation does not continue indefinitely. The presence of $\max\{1;.\}$ in equation (1) implies that even in the absence of any investment, there is a minimum amount of human capital that each agent would have.

3.1.3 Individual Maximization Problem

With these assumptions in place, individual i's problem can be written as:

$$\max_{c_t^i, e_{t+1}^i} u(c_t^i, e_{t+1}^i) \tag{2}$$

[6] An alternative formulation would be to assume that there was some subsistence level of consumption below which people save nothing.

subject to:

$$c_t^i + e_{t+1}^i \leq \hat{y}_t^i \equiv (1 - \tau_t) w_t h_t^i + T_t^i \tag{3}$$

where $\hat{y}_t^i$ is the post tax income of household i, w_t is the equilibrium (before tax) price of one unit of human capital at time t, τ_t is the tax rate on income, and $T_t^i \geq 0$ is the transfer that the agent receives from the state. The budget constraint faced by the agent implies that a unit of consumption good can be either consumed or invested in the offspring's human capital.

3.1.4 Political Institutions

At time $t = 0$ the government is controlled by the elite (the proportion $1 - \lambda$ of the agents who are rich), and they are able to set-the tax rate, τ_t, and therefore, the transfer T_t. Further, government transfers cannot be person specific, thus $T_t^i = T_t$, and the government budget constraint has to hold every period, therefore:

$$T_t = \tau_t A H_t^m, \tag{4}$$

where we used the fact that only human capital used in market production, H_t^m, can be taxed.

The masses (λ poor agents), though initially excluded from the political process, are endowed with a *revolution technology*. Since they form the majority, they can overthrow the existing government and take over the means of production, i.e. the capital stock in any period $t \geq 1$. However, we assume that in the course of the revolution a proportion $1 - \mu > 0$ of the capital of the economy is destroyed, but in return, the poor who have now taken over control can retain all the output of the economy. A low value of μ implies an ineffective revolution technology (e.g. a society in which the poor are

unorganized).

Since output following a revolution is $A\mu H_t$, each poor agent receives,

$$\frac{A\mu H_t}{\lambda}. \tag{5}$$

It should be clear that if the return to a worker from the existing system falls below (5), all workers will be willing to undertake a revolution.[7]

3.1.5 Franchise Extension and Timing of Events

Finally, the elites have another political choice. They can also decide to extend the franchise. In the event of franchise extension, there will be an effective transition to full democracy where the median voter (a poor agent since $\lambda > 1/2$) will choose τ_t.

The timing of events within a period can be summarized as follows.

1. education bequests are received.

2. the elite decides whether or not to extend the franchise to workers.

3. the workers decide whether or not to initiate a revolution. If there is a revolution they share the remaining output of the economy. If there is no revolution, then:

4. the political system decides on what tax rate to choose (i.e. a poor median voter if there is democracy, and a rich agent if not).

[7]Here, there could be a 'free-rider' problem as poor agents could try not to take part in the revolutionary activity but still share the gains of the revolution. We avoid this problem by assuming that if an agent does not participate in the revolution, he receives no returns. We are also assuming that part of the elite cannot enter into a political coalition with the poor.

5. the human capital stock is allocated between market and home production.

6. human capital is traded in a competitive market and receives its return.

7. consumption and bequest decisions are made.

This timing of events emphasizes the commitment problem. The elite cannot commit to a tax rate before workers decide on whether or not to initiate a revolution. Therefore, promises of high taxes will not prevent a revolution, but extending the franchise may. This assumption of no commitment captures the fact that if a section of the society is excluded from the political process, promises of future transfers to them will often be non-credible. How this assumption can be relaxed is discussed in section 7. Moreover, we assume that once the franchise is extended, the rich have no special political power, and since the median voter will always be a poor agent, there will be no return to autocracy (again see section 7).

3.2 Consumption and investment

Problem (2) has a very simple solution;

$$\begin{aligned} e^i_{t+1} &= \gamma \hat{y}^i_t \quad if\ \gamma \hat{y}^i_t > 1 \\ e^i_{t+1} &= 0 \qquad if\ \gamma \hat{y}^i_t \leq 1. \end{aligned}$$

Thus if an agent can afford it, he will invest a fixed proportion of his post tax income in the education of his offspring, but when his income is below a minimum, he will consume all of it.

At this stage we make the following assumption:

Assumption 1: $\gamma A < 1$ and $(\gamma B)^{\beta} Z > 1$.

The first part implies that in the case where there is no taxation ($\tau_t = T_t = 0$), an agent who has the minimum level of human capital ($h_t^i = 1$) will not leave any education to his offspring, thus $h_{t+1}^i = 1$ also. Therefore, it is possible for some households not to accumulate while others do. The second part of the assumption on the other hand guarantees that when accumulation of human capital takes place, and even if the rate of return on human capital is $B < A$, a steady state level of human capital $h > 1$ can be reached. This second part will not only enable accumulation by the rich in the absence of taxation, but it will also ensure that taxation will never be severe enough to stop accumulation.

3.3 Preferences over tax rates

Suppose agent i is the decisive voter, then he would set the tax rate to maximize:

$$\max \{(1 - \tau_t)A, B\} h_t^i + \tau_t A H_t^m(\tau_t), \tag{6}$$

Let us explain this expression. The decisive voter will take into account the fact that by taxing incomes (human capital), he will be taxing himself, and this is the first term. The 'max' operator takes into account that the individual will invest in the market or home sector depending on which one has the higher return. The second term is T_t solved out from equation (4), realizing that the amount of investment in the market sector will depend on the tax rate (also recall that transfers cannot be person specific). Therefore, the optimal tax rate of the decisive voter will depend on the form of the function $H_t^m(\tau_t)$ and on how large h_t^i is relative to H_t^m.

It is clear that a rich agent, who has $h_t^r > H_t^m$, would hurt himself by

taxing, and therefore, would choose a tax rate $\tau_t^r = 0$. In contrast, the poor would like to choose a positive tax rate. If $H_t^m(\tau_t)$ were perfectly inelastic, a poor agent would choose $\tau_t = 1$. However, since the amount of capital is predetermined, and its only alternative use is in the informal sector, $H_t^m(\tau_t)$ is perfectly inelastic for $(1-\tau_t)A > B$, but it is perfectly elastic for $(1-\tau_t)A \leq B$. This immediately yields the preferred tax rate of a poor agent:

$$\tau_t^p = \frac{A-B}{A}, \tag{7}$$

and implies that all human capital will be invested in the market sector, i.e. $H_t^m = H_t$.

4 Equilibrium Dynamics

We now make a taxonomy of different cases in detail and for expositional convenience, we ignore the revolution constraint until the next section. The first two types of equilibrium dynamics will have the elite in power, thus the tax rate will be $\tau_t = \tau_t^r \equiv 0$. Since the minority is in power ($\lambda > 1/2$), these cases are *non-democratic*. In the first, we will have the poor unable to accumulate capital, and the economy will exhibit increasing inequality. In the second, there will be decreasing inequality as the poor will also accumulate. These two cases will also tend to different levels of steady state output. The next case will have *democracy* so that the median voter is a poor agent who redistributes from the rich to the poor.

In all of these case, we want the elite to accumulate, thus we will only consider initial conditions such that:

$$h_{SS}^r > h_0^r > (\gamma A)^{-1} \tag{8}$$

where h_{SS}^r is the steady state value of the rich agents' human capital. The first part of the inequality ensures that we start with less than steady state human capital, thus there will be *growth* (rather than decumulation of capital). The second inequality ensures that rich agents are beyond the point of non-convexity, and are able to leave positive educational bequests to their offspring. We also assume that $H_0 > (\gamma A)^{-1}$, so that if $h_0^r = h_0^p = H_0$, then all agents could accumulate, but with income inequality, it is not guaranteed that the poor will be able to accumulate.

4.1 Case 1: Autocracy and Only the Rich Accumulate

Since we have autocracy (no democracy), $\tau_t = 0$. Suppose also that $h_0^p < (\gamma A)^{-1}$, then given Assumption 1, we have that $h_t^p = 1 \ \forall t > 0$. Thus the poor will not be able to accumulate. The rich on the other hand will accumulate and the human capital dynamics for this group will follow:

$$\begin{aligned} h_{t+1}^r &= Z\left(e_t^r\right)^\beta \\ &= Z\left(\gamma A h_t^r\right)^\beta. \end{aligned}$$

This dynamic equation has a unique steady state:

$$h_{SS} = \left((\gamma A)^\beta Z\right)^{\frac{1}{1-\beta}}. \tag{9}$$

Since $(\gamma B)^\beta Z > 1$ by Assumption 1, and $A > B$, we have that $h_{SS} > 1$.

What will happen to inequality along the equilibrium path? Since the proportions of poor and rich agents do not vary over time, inequality can be

measured by the income ratio of the rich to the poor: $\frac{y_t^r}{y_t^p}$, and this is given as:

$$\frac{y_t^r}{y_t^p} = \frac{Ah_t^r}{A} = h_t^r.$$

Because on the way to the steady state h_t^r increases, inequality rises too.

Finally, we can also calculate the steady state level of aggregate income in this economy which is given as:

$$Y_{SS}^1 = A\left[(1-\lambda)\left((\gamma A)^\beta Z\right)^{\frac{1}{1-\beta}} + \lambda\right].$$

4.2 Case 2: Autocracy and All Agents Accumulate

Suppose that the initial capital H_0 is distributed such that $h_0^r > h_0^p > (\gamma A)^{-1}$, and also still $\tau_t = 0$. Then we have:

$$\begin{aligned} h_{t+1}^r &= Z(\gamma A h_t^r)^\beta \\ h_{t+1}^p &= Z(\gamma A h_t^p)^\beta. \end{aligned}$$

Since $h_0^p > (\gamma A)^{-1}$, the poor will be able to accumulate with $h_t^p > 1\ \forall t$. This implies that both groups will converge to the same steady state, h_{SS}. Since the poor by definition start with less human capital and converge to the same level, along this equilibrium path, inequality is decreasing. The steady state level of aggregate income is simply given by:

$$Y_{SS}^2 = A\left((\gamma A)^\beta Z\right)^{\frac{1}{1-\beta}} > Y_{SS}^1$$

Therefore, this economy converges to a more equal distribution of income and also to a higher level of aggregate output than the previous case.[8]

[8]Moreover, it is straightforward to check that the growth rate of output, $\frac{Y_{t+1}}{Y_t} - 1$, of an

4.3 Case 3: Democracy

We now consider the dynamics under democracy. We know that in this case $\tau_t = \tau_t^p \equiv \frac{A-B}{A}$. Accumulation dynamics are then given as:

$$\begin{aligned} h_{t+1}^r &= \max\left\{1, Z\left(\gamma\left[(A-B)H_t + Bh_t^r\right]\right)^\beta\right\} \\ h_{t+1}^p &= \max\left\{1, Z\left(\gamma\left[(A-B)H_t + Bh_t^p\right]\right)^\beta\right\} \end{aligned} \tag{10}$$

First, note that the second part of Assumption 1, $(\gamma B)^\beta Z > 1$, is sufficient to ensure that the first equation in (10) will always give $h_{t+1}^r > 1$ for $h_t^r > 1$, thus taxation will not stop accumulation by the rich. This does not however guarantee that the poor will be able to accumulate thanks to redistribution. If $h_0^p > (\gamma A)^{-1}$, so that in the absence of redistributive taxation the poor would be able to accumulate, then they will also be able to do so when they receive transfers. Therefore, we will only analyze the case of $h_0^p < (\gamma A)^{-1}$ in detail.

To start with, suppose that transfers are not enough to ensure accumulation by the poor. Then, we have $h_t^p = 1$, and h_t^r converges to the steady-state level h_{SS}^D which satisfies the equation,

$$h_{SS}^D = \gamma Z\left[(A(1-\lambda) + \lambda B)\, h_{SS}^D + (A-B)\lambda\right]^\beta.$$

This equation follows directly from (10). Since the LHS is a straight line from the origin and the RHS is a strictly concave function starting from a positive value, there is a unique h_{SS}^D that satisfies this equation, and it is straightforward to see that $h_{SS}^D < h_{SS}$. Let also Y_{SS}^D denote the steady-state

economy which starts with capital H_0 equally distributed (i.e. in case 2) is always higher than the growth rate of the same economy with human capital distributed unequally (i.e. in case 1).

level of output in this case; thus $Y_{SS}^{D} = A\left[\lambda + (1-\lambda)h_{SS}^{D}\right]$ which is clearly less than Y_{SS}^{2} and Y_{SS}^{1}.

Whether the economy is in this case, or equivalently, whether the poor will ever be able to accumulate capital depends on the following condition:

Condition 1: $\gamma\left[(A-B)\left((1-\lambda)h_{SS}^{D}+\lambda\right)+B\right] > 1$

This condition states that when $h_t^p = 1$ and $h_t^r = h_{SS}^{D}$, the redistribution from taxation will be sufficient to enable the poor to accumulate. To see this note that the term in square brackets is the post tax income of a poor household with $h_0^p = 1$: he receives B, after tax, on his human capital and the first term is the total per person transfer in this economy when $h_t^p = 1$ and $h_t^r = h_{SS}^{D}$. This term multiplied by γ is the education expenditure of a poor household, and when it is greater than 1, there will be accumulation by the poor. Moreover, Condition 1 is also necessary for accumulation by the poor. When it is violated, there exists no $h_t^r < h_{SS}^{D}$ that will generate enough tax revenue to enable accumulation by the poor. When the poor accumulate thanks to redistributive taxation, the economy converges to Y_{SS}^{2} with both the poor and the rich converging to h_{SS}. Although there is taxation of the capital in this economy, because the stock of capital is unaffected by taxation, there is no aggregate 'cost' of taxation.

When the poor do not accumulate, inequality, again measured as

$$\frac{\hat{y}_t^r}{\hat{y}_t^p} = \frac{(A-B)\left((1-\lambda)h_t^r+\lambda\right)+Bh_t^r}{(A-B)\left((1-\lambda)h_t^r+\lambda\right)+B},$$

will increase despite the fact that there are also increased transfers to the poor.

In contrast, when the poor accumulate, inequality will decrease over time, as in the previous case. Therefore, when Condition 1 holds, the poor will start

accumulating at some point, and inequality will eventually decline. Whether inequality ever increases depends on whether the poor to start accumulating from period $t = 0$. The necessary condition for this is:

Condition 2: $\gamma\left[(A-B)\left((1-\lambda)h_0^r + \lambda h_0^p\right) + Bh_0^p\right] > 1.$

This condition is quite straightforward to understand: for the poor to start accumulating from time $t = 0$, we need their after tax income times the savings rate (γ) to be greater than 1, thus $\gamma\hat{y}_0^p > 1$. Condition 2 ensures this. The first term in square bracket is the transfer and the second term is the net wage (after tax) income of a poor household. Also notice that since $h_0^r < h_{SS}^D$ and $h_0^p \geq 1$, Condition 1 is more restrictive than Condition 2.

4.4 Summary of Equilibrium Dynamics

It is useful at this stage to summarize the equilibrium dynamics in the form of a proposition (proof in the text).

Proposition 1 *Suppose that Assumption 1 holds, that* $h_0^r \in \left((\gamma A)^{-1}, h_{SS}\right)$ *where* h_{SS} *is given in (9), and that the political system is autocratic. Then, we have* $\tau_t = 0$ *and:*

1. *If* $h_0^p \leq (\gamma A)^{-1}$, *then* $h_t^p = 1\ \forall t > 0$, h_t^r *converges monotonically to* h_{SS}, *aggregate output converges to* Y_{SS}^1, *and inequality increases monotonically.*

2. *If* $h_0^p > (\gamma A)^{-1}$, *then both* h_t^p *and* h_t^r *converge monotonically to* h_{SS}, *aggregate output converges to* $Y_{SS}^2 > Y_{SS}^1$, *and inequality decreases monotonically.*

Proposition 2 *Suppose that Assumption 1 holds, that* $h_0^r \in ((\gamma A)^{-1}, h_{SS}^D)$ *where* h_{SS} *is given in (9), and that the political system is democratic. Then we have* $\tau_t = \frac{A-B}{A}$ *and;*

1. *If* $h_0^p > (\gamma A)^{-1}$, *then both* h_t^p *and* h_t^r *converge monotonically to* h_{SS}, *aggregate output converges to* $Y_{SS}^2 > Y_{SS}^1$, *and inequality decreases monotonically.*

2. *If* $h_0^p \leq (\gamma A)^{-1}$ *and Condition 2 holds, then inequality decreases monotonically, and* h_t^p *and* h_t^r *converge to* h_{SS}, *aggregate output converges to* Y_{SS}^2.

3. *If* $h_0^p \leq (\gamma A)^{-1}$ *and Condition 1 fails to hold, then inequality increases monotonically,* $h_t^p = 1 \ \forall t > 0$, *and* h_t^r *converges to* h_{SS}^D, *and aggregate output converges to* $Y_{SS}^D < Y_{SS}^2$.

4. *If* $h_0^p \leq (\gamma A)^{-1}$ *and Condition 1 holds and Condition 2 fails to hold, then there exists* t^*, *such that* $h_t^p = 1 \ \forall t < t^*$, *and* h_t^p *is growing* $\forall t \geq t^*$. *Inequality is increasing until* t^* *and decreases thereafter. Aggregate output converges to* Y_{SS}^2.

There are a number of things that are important to note.

1. In this model democracy is good for economic performance if it enables accumulation by the poor, but detrimental otherwise. In the absence of democracy, $h_0^p < (\gamma A)^{-1}$ condemns the economy to the lower level of steady state output Y_{SS}^1 because the poor do not have enough wealth to start accumulating. In contrast, with democracy, the conditions for 'stagnation' are much more stringent because part of the income of the rich is redistributed to the poor. However, when democracy does not

enable the poor to accumulate, the economy converges to Y_{SS}^{D} which is even less than Y_{SS}^{1} because the income of the rich, who are the only ones accumulating, is reduced. The result that democracy is unambiguously good for growth if it enables accumulation by the poor is special; it hinges on the fact that there are no 'allocative' costs of redistributive taxation. With some of the costs as emphasized by Alesina and Rodrik (1994) and Persson and Tabellini (1994), democracy would have an ambiguous effect even in this case: the positive effect of redistribution on human capital accumulation by the poor may be offset by slower accumulation by the rich. Therefore, the empirical results that show no robust correlation between democracy and growth should not be too surprising.

2. In the absence of redistributive taxation, there is no Kuznets curve: inequality is always increasing or decreasing. The intuition for the Kuznets curve with redistributive taxation is that when the rich are not sufficiently wealthy, the transfers from them to the poor will not ensure accumulation, and this leads to increasing inequality. But when the rich become 'rich' enough, transfers increase and the poor start accumulating as well and inequality falls. Therefore, redistributive taxation is key in this model for the Kuznets curve. However, this configuration of the Kuznets curve is not totally compelling because as argued earlier, it is plausible to suppose that most of the Western societies were not democratic when incomes started rising nor was there any redistributive taxation. We will see that the Kuznets curve will arise for a larger set of parameter values when we add the possibility of revolution and franchise extension to an economy with the elite in

power, and this we believe is a much more plausible explanation for the Kuznets curve.

3. For a given level of capital H_0, an unequal distribution is harmful to development. When the poor have $h_0^p > (\gamma A)^{-1}$, the economy converges to the higher steady state Y_{SS}^2, whereas otherwise it may get stuck in the lower steady state with per capita income Y_{SS}^1. This relation between inequality and prosperity applies both for a democracy and an autocracy.

5 The Threat of Revolution

We will now analyze an economy which starts with the elite in power. If the revolution constraint never becomes binding (e.g. if μ is very small), then the equilibrium dynamics of Proposition 4.1 will apply. If on the other hand revolution becomes a real threat, the rich have to redistribute to the workers in order to prevent a revolution, and in our model the only method of credible redistribution is *to extend the franchise* (see below and section 7). Therefore, when the revolution constraint becomes binding, the franchise is extended and the dynamics of Proposition 4.1 are replaced with those of Proposition 4.2 where the median voter is a poor agent.

The revolution constraint, when the rich are in power, can be written as:

$$Ah_t^p \geq \frac{A\mu\left[(1-\lambda)h_t^r + \lambda h_t^p\right]}{\lambda}$$

or

$$\frac{h_t^r}{h_t^p} \leq \frac{\lambda(1-\mu)}{\mu(1-\lambda)} \tag{11}$$

The left hand side of the first inequality is what a poor agent gets in the absence of revolution at time t and the right hand side is the share of a poor agent after the revolution. In words, this is equal to a fraction μ of total output divided among all the poor agents, λ.[9] When (11) holds, there will be no revolution at time t. Two points to note about this revolution constraint are as follows: first, the higher is μ, the tighter is the revolution constraint which is fairly intuitive. Second, the higher is λ, the less tight is (11); this is because the benefit of the revolution is to takeover the wealth of the rich and when there are fewer of them with the same income level (i.e. h_t^r is given), the return from revolution falls.

5.1 Revolution Conditions: When Only the Rich Accumulate (Case 1)

In case 1, the economy converges to Y_{SS}^1 with increasing inequality on the way with the poor stuck at $h_t^p = 1$. If (11) is not binding at the point of steady state (which has maximal inequality), it will never bind. Thus we have:

Condition 3: $h_{SS} > \frac{\lambda(1-\mu)}{\mu(1-\lambda)}$.

If Condition 3 holds, the revolution threat will become effective at some point during the course of accumulation by the rich. If it fails to hold, then we can ignore the revolution constraint.

[9] It is assumed that the rich get nothing after revolution, but clearly, if they receive some positive amount, none of our results would be affected.

5.2 Revolution Conditions: When All Agents Accumulate (Case 2)

The important point to note is that in this case inequality is decreasing, thus it is highest at time $t = 0$. Then we have:

Condition 4: $\frac{h_0^r}{h_0^p} < \frac{\lambda(1-\mu)}{\mu(1-\lambda)}$.

If Condition 4 is satisfied, then in Case 2 there is no revolution threat at time $t = 0$ and since inequality is lower after this point, there is never any revolution threat. The case in which both Conditions 3 and 4 hold is of interest (which is a non-empty set of parameters since when the poor accumulate $h_0^p > 1$, thus $\frac{h_0^r}{h_0^p} < h_{SS}$). In this case, if the poor are excluded from the accumulation process, at some point they will want to redistribute resources to themselves by force. If on the other hand, they are also accumulating along the development path, they will not perceive revolution as a worthwhile activity.

5.3 What Happens When the Revolution Constraint Binds?

In this case, the elites realize that without some redistribution, they will lose all their income. However, by assumption, they are unable to redistribute before the revolution decision of the workers, and if they promise to redistribute in the future, this will not be credible. With the apparatus of the state in the hands of the elite, there is no guarantee that they will not change their minds. This is captured in the timing of our model: workers have no revolution choice after taxation, it is only before the taxation decision. As a result, the elite have no means of committing to redistribution other than cease to be the political elite, that is *extend the franchise.*

The next question to ask is whether the extension of the franchise is sufficient to stave off a revolution. One can imagine that if μ is very close to 1, workers would still prefer a revolution. Thus, we need to impose one more condition to ensure that taxing the rich is a better option for the poor than a revolution. Hence, we need:

$$(A-B)\left((1-\lambda)h_t^r+\lambda h_t^p\right)+Bh_t^p \geq \frac{A\mu\left[(1-\lambda)h_t^r+\lambda h_t^p\right]}{\lambda}$$

whenever the revolution constraint binds. Clearly the left hand side is what the worker gets after redistributive taxation, and the right hand side is what he gets with revolution. We are particularly interested in the case when the revolution constraint holds while the poor are not accumulating (cfr. Condition 3), and to ensure that in this case franchise extension will stave off the revolution it is sufficient to assume that:

Assumption 2: $\frac{(\lambda-\mu)\left((1-\lambda)h_{SS}^D+\lambda\right)}{(1-\lambda)h_{SS}^D} \geq \frac{B}{A}$.

We will suppose in what follows that Assumption 2 holds which means that extending the franchise will be sufficient to stop a revolution. Intuitively, this assumption requires B not to be too large relative to A. Otherwise, the poor would not be able to tax the rich sufficiently, and they would prefer revolution to democracy.

6 Implications For Growth and Democratization

In this section, we put the analysis of the previous two sections together and outline some possible paths of development. Throughout we assume that Assumptions 1 and 2 hold.

6.1 Kuznets Curve

Suppose that initially, the elite in power, and we are in case 1. Accumulation starts with the rich, and inequality increases. Now if Condition 3 holds, then at some point the revolution constraint will bind, and the rich will realize that they can only prevent revolution by extending the franchise (since they cannot commit to other forms of redistribution given the timing we have assumed). Therefore, in this case, the economy will follow the path of increasing inequality with the rich accumulating and the poor not accumulating until some time $\hat{t}$. At $\hat{t}$, as the rich become 'rich enough', the revolution constraint will bind, the franchise will be extended, the tax rate will be set at $\tau_t = \frac{A-B}{A}$. And as long as Condition 1 holds, the redistribution will enable the poor to start accumulating, thus inequality will start falling and aggregate output will converge to Y^2_{SS}. In our view, this sequence of events corresponds to the experience of Britain where, after a period increasing inequality, social unrest forced the extension of the franchise, then schooling and redistribution went up rapidly and inequality declined. Suitably interpreted, we also feel that this pattern of events is useful for understanding the US case.

An interesting recent case which also mirrors this experience is Brazil. Under autocratic military regimes Brazil grew rapidly in the late 1960's and 1970's (for example the average annual growth rate of real GDP 1968-1978 was 9.1%, see de Castro and Ronci, 1991). Inequality widened from a Gini of 0.53 in 1960 (Fields, 1995) to an average Gini of 0.60 in the period 1981-1990 (Campos and Root, 1996), and as the social unrest against the military regime grew, Brazil witnessed a transition to democracy (interestingly at around the same value for the Gini coefficient that Britain had in 1870).

6.2 East Asian Miracle

Instead suppose we start with the elite in power but in case 2. Compared to the previous case inequality is limited, and the poor can accumulate. Then, the economy will grow with falling inequality, and as long as Condition 4 is satisfied, the threat of revolution will never arise. This is because along this development path, the poor segments of the society are, at least to some degreem sharing in the benefits of rising average per-capita income, and therefore do not find it worthwhile to create social unrest. This case reminds us of Taiwan and South Korea which, in the post war period, experienced fast growth but no democratization.[10]

6.3 Autocratic Disaster

In our final configuration, the economy again starts in case 1, but this time due to the absence of a well-developed civil society or other factors, μ is small (that is, the poor will have a hard time organizing, therefore a revolution would be very costly for them) and Condition 3 is violated. In this case inequality will increase and the poor will never accumulate and the economy will converge to the low steady state Y_{SS}^1 with high inequality. The interesting point to note is that the only difference between this case, reminiscent of the Philippines during the post-war period, and the development path of the

[10]We are of course aware that a process of democratization is now occurring in South Korea and Taiwan. This can be because at some level of development, the masses may demand representation for other reasons than pure redistribution, or that as the poor get richer, μ may increase because they can afford to organize. We think for the purposes of the present study it is interesting to understand the prolonged autocratic regimes in these countries as opposed to the experiences of much faster democratization in Britain. Also, it is interesting that in line with the prediction of our model, inequality fell to some degree in these economies. The average Gini coefficient over the period 1965-1970 was 0.34 for South Korea and 0.32 for Taiwan, and these averages fell to 0.33 and 0.30 respectively for the period 1981-1990, see Campos and Root, 1996, Table 1.1.

Kuznets curve with democratization and higher growth is the size of μ. If μ were large so that revolution became a real threat, this economy could democratize, redistribute to the poor, and possibly reach a higher level of income. Thus, whether a good 'revolution technology' hinders or enhances growth depends on which case the economy is in (see also the discussion in the next section).

Finally, the main difference between this case and the East Asian miracle of South Korea and Taiwan is the starting level of inequality. As noted by Lucas (1993), while the Philippines stagnated, South Korea and Taiwan experienced fast growth, but Korea, Taiwan and the Philippines were in similar situations in 1960, except that the Gini coefficient of income inequality was 0.34 in 1965 in South Korea and 0.31 in 1964 in Taiwan whereas it was 0.45 in Philippines in 1957 (see Fields, 1995). In terms of our model, a more equal economy with $h_0^p > (\gamma A)^{-1}$ would again fail to democratize, but because the poor would be able accumulate, the level of income and the growth rate would be greater.

7 Extensions

In this section we will informally discuss some extensions and how some of the simplifying assumptions can be relaxed.

7.1 Why Are Other Methods of Redistribution Non-Credible?

Our assumption that other forms of redistribution are non-credible, embedded in the structure whereby agents live for one period and taxes are set after the revolution decision, is extreme. The example of Bismarck who at-

tempted to stop the rise of social democracy and socialism in Germany by instituting the welfare state is telling. It is also possible to envisage different models whereby the threat of future revolution by long-lived agents may be sufficient to support a repeated game equilibrium with redistribution.[11]

To see why our assumption is reasonable, first note that in general, the cost of redistribution is likely to be convex (as it is in our case since a tax rate higher than $\frac{A-B}{A}$ would be very costly). Therefore, to compensate the poor enough to avoid a revolution would require redistribution not only today but also in the future. However, this will run into problems. First, the promise of future redistribution to a group excluded from political power is problematic. The elite would redistribute some today but in the mean time, it would invest more in the army or other methods of pacifying the poor, and thus weaken the revolution constraint in the future, avoiding future redistributions. Alternatively, we can imagine that μ follows a Markov process over time, capturing the idea that some periods are more appropriate for collective action and social unrest than others (if the French Revolution did not take place in 1789, would it have done so in 1795?). In both cases, the poor would anticipate that the revolution constraint would not necessarily bind in the future, would not trust promises of future transfers, and the elite would be forced to extend the franchise (see Acemoglu and Robinson, 1996 for such a model with repeated interactions).

7.2 Why is the Extension of the Franchise Credible and Irreversible?

Can the extension of the franchise be reversed? We believe the answer to be no, or at any rate, not without major political upheaval and costs. Part

[11]Though typically such a threat would not be renegotiation-proof.

of the reason is probably sociological, that 'rights' cannot easily be taken away (i.e. the 'endowment effect'). Moreover, once a certain segment of the population starts taking part in elections, they know more about the economy and are better organized, thus excluding them is much harder (for instance, the impact of the Trade Unions movement on the British working class during the nineteenth century).

7.3 More General Production Functions

We have followed the standard practice in this type of model whereby H_0 is fixed, and then inequality can be thought of as the distribution of this stock of assets among different agents. However, what matters for development is h_0^p, which is the level of *poverty* of the masses. This is not a general conclusion. If we had the aggregate production function as $F(H_t)$ with decreasing returns to scale it would be inequality (or relative rather than absolute poverty of the masses) that mattered because a higher level of h_t^r for a given h_0^p would reduce the marginal product of human capital and thus the earnings of the poor.

7.4 Distortionary Taxation

In order to make our point in the simplest model, we assumed redistributive taxation to be without distortions. It is straightforward to see that if this assumption is relaxed, then a democratic society would actually tend to an income level $Y_{SS}^3 \leq Y_{SS}^2$. Whether this inequality is strict or not will depend on a number of other features which are not crucial for our story but would strengthen the conclusion mentioned above, that the lack of robust correlation between democracy and growth may not be surprising.

7.5 Revolution and Political Instability

In our analysis so far, a revolution is never observed along the equilibrium path. This is not a general result. First, if Assumption 2 is relaxed, the extension of the franchise would not be sufficient to stop a revolution. In particular, an economy where B is high relative to A would suffer from this problem. It is interesting to speculate that compared to many other European countries, taxing the rich was probably much harder in Russia, and this may have increased the relative attraction of a revolution.

Another possibility is to have a stochastic revolution technology where an attempted revolution succeeds with probability π. The additional implication of this case would be that when the elite judges π to be small, they may not want to extend the franchise, and instead, use other methods to prevent the revolution. In this case a revolution could again occur 'along the equilibrium path'. What the empirical growth literature (e.g. Alesina et al., 1996) actually measures as political instability may correspond much more closely to actual instances of revolution or efforts by the elites to prevent revolution rather than the revolution constraint triggering redistribution in our economy.

7.6 Forward-Looking Behavior by the Elite

In our model capital accumulation is 'myopic' because agents live only one period and do not care about the dynamics after they die. If we introduce more general kinds of altruism or long horizons for the agents, the elite may accumulate slower than otherwise in order not to hit the revolution constraint. Intuitively, the elite may realize that if they collectively have assets worth H^* the revolution threat will become active and they will have

to redistribute, reducing their net income. Thus they may stop accumulating at some level less than H^*. However, the important point to note is that this requires some kind of coordination from the 'state'. If each member of the elite is deciding individually, he would ignore his impact on the aggregate stock of assets, and thus would 'free-ride', and such behavior by all the members would take the economy to H^*.

8 Conclusion

This paper has offered a model which links democracy, redistribution, inequality and growth. Our analysis is motivated by the political and economic events of the nineteenth century, especially in Britain. In our economy, political power is initially concentrated in the hands of a rich elite. Under some parameter configurations, inequality starts to increase with growth and this triggers social unrest by the masses who are not sharing in the gains generated by growth. The social unrest and the threat of revolution are prevented by a commitment to future redistribution in the form of a franchise extension (i.e. democratization). Democratization opens the way to taxation and public schooling, and therefore enables a reduction in inequality, but may also improve economic performance because the masses are now able to accumulate human capital. Overall, our model proposes a new explanation for the Kuznets curve, an explanation for the radical political reforms of the nineteenth century, and a novel view of the origins of redistributive policies.

The parameter configuration which lead to the Kuznets curve is not the only possibility. If the economy starts from an initial position of greater equality it can grow with all social classes accumulating. In this case, there is no increase in inequality, no threat of revolution, and hence no democra-

tization. Finally, it is possible for the economy to start with high inequality and get stuck in a low output steady state before the revolution constraint becomes binding. Such an autocratic disaster could be avoided if the country had a more developed civil society to force democratization before the steady state was reached.

Overall, the two key innovations of our approach are:

1. the modelling of the political system with an elite in power which is constrained by some 'exit' technology of the rest of the society.

2. a formal analysis of political reform and its interaction with economic performance.

We believe that both of these features are highly relevant to an understanding of the political economy of development and deserve future research. In particular, if we are to uncover why African and some Latin American countries performed so badly while the rest of the world grew rapidly, we have to understand why these countries were subject to a lot of turmoil, to 'bad policies' and to *highly inefficient* redistributive efforts. This question requires a framework where there are elites with a disproportionate share of the political power, competition for political power among social classes, and also a model of the presence or absence of political reform.

9 Bibliography

Acemoglu, D. and J. A. Robinson (1996) "When to Eat the Cake and When to Have It: On the Form of Redistribution" in progress.

Ades, A. (1995) "Economic Development with Endogenous Political Participation," *Economics and Politics*, 7, 93-117.

Ades, A. and T. Verdier (1993) "The Rise and Fall of Elites: Economic Development and Social Polarization in Rent-Seeking Societies," Unpublished Paper, DELTA, Paris.

Aghion, P. and P. Bolton (1995) "A Trickle-Down Theory of Growth and Development with Debt Overhang," forthcoming in the *Review of Economic Studies.*

Alesina, A., S. Ozler, N. Roubini and P. Swagel (1996) "Political Instability and Economic Growth," forthcoming in the *Journal of Economic Growth.*

Alesina, A. and D. Rodrik (1994) "Distributive Politics and Economic Growth," *Quarterly Journal of Economics*, 109, 465-490.

Anand, S. and R.M. Kanbur (1993) "Inequality and Development: A Critique," *Journal of Development Economics*, 41, 19-44.

Baldwin, P. (1990) *The Politics of Social Solidarity: Class Bases of the European Welfare State, 1875-1975*, Cambridge University Press, Cambridge.

Banerjee, A. and A.F. Newman (1993) "Occupational Choice and the Process of Development," *Journal of Political Economy*, 101, 274-298.

Banerjee, A. and A.F. Newman (1996) "Development and Modernization" MIT Mimeo.

Barro, R.J. (1995) "Democracy and Growth," *Journal of Economic Growth*, 1, 1-28.

Bénabou, R. (1996a) "Inequality and Growth," forthcoming in the *NBER Macroeconomics Annual.*

Bénabou, R. (1996b) "Unequal Societies," NBER Working Paper #5583.

Briggs, A. (1959) *The Age of Improvement*, Penguin, London.

Campos, J.E. and H.L. Root (1996) *The Key to the Asian Miracle: Making Shared Growth Credible*, Brookings Institution, Washington DC.

Carstairs, A.M. (1980) *A Short History of Electoral Systems in Western Europe*, George Allen and Unwin, London.

Cowling, M. (1967) *1867: Disraeli, Gladstone and Revolution*, Cambridge University Press, Cambridge.

Crafts, N.F.R. (1989) "Real Wages, Inequality and Economic Growth in Britain, 1750-1850: A Review of Recent Research," in P. Scholliers ed. *Real Wages in Nineteenth and Twentieth Century Europe*, Berg, Oxford.

Crotty, W.J. (1977) *Political Reform and the American Experiment*, Thomas Crowell Company, New York.

de Castro, P.R. and M. Ronci (1991) "Sixty Years of Populism in Brazil," in R. Dornbusch and S. Edwards eds. *The Macroeconomics of Populism in Latinamerica*, University of Chicago Press, Chicago IL.

Darvall, F.O. (1934) *Popular Disturbances and Public Order in Regency England*, MacMillan, London.

Easterlin, R.A. (1981) "Why Isn't The Whole World Developed?" *Journal of Economic History*, 41, 1-19.

Evans, E.J. (1983) *The Forging of the Modern State: Early Industrial Britain, 1783-1870*, Longman, New York.

Feinstein, C. (1988) "The Rise and Fall of the Williamson Curve," *Journal of Economic History*, 48, 699-729.

Fields, G.S. (1995) "The Kuznets Curve: A Good Idea, But..." Unpublished Working Paper, Department of Economics, Cornell University.

Fields, G.S. and G.H. Jakubson (1994) "New Evidence on the Kuznets Curve," Unpublished Working Paper, Department of Economics, Cornell University.

Flora, P. and A. J. Heidenheimer (1981) "The Historical Core and Changing Boundaries of the Welfare State" in Flora, P. and A. J. Heidenheimer, *The Development of the Welfare State in Europe and America*, Transaction Books, 1981

Galor, O. and D. Tsiddon (1996) "Income Distribution and Growth: The Kuznets Hypothesis Revisited," *Economica*, 63, S103-S118.

Galor, O. and J. Zeira (1993) "Income Distribution and Macroeconomics," *Review of Economic Studies*, 60, 35-52.

Goldin, C. (1994) "How America Graduated from High School: 1910-1960," NBER Working Paper #4762.

Goldin, C. and L. Katz (1996) "The Origins of Technology-Skill Complementarity," NBER Working Paper #5657.

Grossman, H.I. (1991) "A General Equilibrium Theory of Insurrections," *American Economic Review*, 81, 912-921.

Grossman, H.I. (1993) "Production, Appropriation and Land Reform," *American Economic Review*, 84, 705-712.

Harrison, R. (1965) *Before the Socialists: Studies in Labour and Politics, 1861-1881*, Routledge & Kegan Paul, London.

Heidenheimer A. J. (1981) "Education and Social Security Provisions in Europe and America" in Flora, P. and A. J. Heidenheimer, *The Devel-*

opment of the Welfare State in Europe and America, Transaction Books, 1981

Helliwell, J. (1994) "Empirical Linkages Between Democracy and Economic Growth," *British Journal of Political Science*, 24, 225-248.

Kaelble, H. (1986) *Social Mobility in the 19th and 20th Centuries: Europe and America in Comparative Perspective*, St. Martin's Press, New York.

Lee, S.J. (1994) *Aspects of British Political History, 1815-1914*, Routledge, London.

Lindert, P.H. (1986) "Unequal English Wealth since 1670," *Journal of Political Economy*, 94, 1127-1162.

Lindert, P.H. (1989) "Modern Fiscal Redistribution: A Preliminary Essay," University of California at Davis, Agricultural History Center, Working Paper No. 55.

Lindert, P.H. (1994) "The Rise in Social Spending, 1880-1930," *Explorations in Economic History*, 31, 1-37.

Lindert, P.H. (1996) "What Limits Social Spending?", *Explorations in Economic History*, 33, 1-34.

Lindert, P.H. and J.G. Williamson (1985) "Growth, Equality and History," *Explorations in Economic History*, 22, 341-377.

Lucas, R.E. Jr. (1993) "Making a Miracle," *Econometrica*, 61, 251-272.

Mitch, D. (1992) *The Rise of Popular Literacy in Victorian England: The Influence of Private Choice and Public Policy*, University of Pennsylvania Press, Philadelphia.

Mitch, D. (1993) "The Role of Human Capital in the First Industrial Revolution," in J. Mokyr ed. *The British Industrial Revolution: An Eco-*

MIT LIBRARIES
3 9080 01428 3029

nomic Perspective, Westview Press, San Francisco.

Mokyr, J. (1993) "Introduction," in J. Mokyr ed. *The British Industrial Revolution: An Economic Perspective*, Westview Press, San Francisco.

Muller, E.N. (1988) "Democracy, Economic Development and Income Inequality," *American Sociological Review*, 53,

Muller, E.N. and M.A. Seligson (1987) "Inequality and Insurrections," *American Political Science Review*, 81, 425-451.

North, D.C. and B.R. Weingast (1989) "Constitutions and Commitment: Evolution of the Institutions Governing Public Choice in 17th Century England," *Journal of Economic History*, 49, 803-832.

Perotti, R. (1996) "Growth, Income Distribution and Democracy," *Journal of Economic Growth*, 1,

Persson, T. and G. Tabellini (1994) "Is Inequality Harmful for Growth? Theory and Evidence," *American Economic Review*, 84, 600-621.

Przeworski, A. and F. Limongi (1993) "Political Regimes and Economic Growth," *Journal of Economic Perspectives*, 7, 51-69.

Ringer, F. (1979) *Education and Society in Modern Europe*, Indiana University Press, Bloomington.

Roemer, J.E. (1985) "Rationalizing Revolutionary Ideology: A Tale of Lenin and the Tsar," *Econometrica*, 53, 85-108.

Rodrik, D. (1994) "King Kong Meets Godzilla: The World Bank and the *East Asian Miracle*," C.E.P.R Discussion Paper No. 944.

Rueschemeyer, D., E.H. Stephens and J.D. Stephens (1992) *Capitalist Development and Democracy*, University of Chicago Press.

Saint-Paul, G. (1995) "The Dynamics of Exclusion and Fiscal Conservatism," C.E.P.R. Discussion Paper No. 998.

Saint-Paul, G. and T. Verdier (1993) "Education, Democracy and Growth," *Journal of Development Economics*, 42, 399-407.

Schofield, R. (1973) "Dimensions of Illiteracy, 1750-1850," *Explorations in Economic History*, 10, 437-454.

Simon, B. (1960) *Studies in the History of Education*, Lawrence and Wishart, London.

Stevenson, J. (1979) *Popular Disturbances in England, 1700-1870*, Longman, New York.

Tampke, J. (1981) "Bismarck's Social Legislation: A Genuine Breakthrough?" in W.J. Mommsen ed. *The Emergence of the Welfare State in Britain and Germany, 1850-1950*, Croom Helm, London.

Trevelyan, G.M. (1937) *British History in the Nineteenth Century and After, 1782-1919*, Longman, Green and Co. Publishers, London.

Williamson, C. (1960) *American Suffrage: From Property to Democracy 1760-1860*, Princeton University Press, Princeton.

Williamson, J.G. (1985) *Did British Capitalism Breed Inequality?* Allen and Unwin, Boston.

Williamson J. G. and P.H. Lindert (1980) *American Inequality: A Macroeconomic History*, Academic Press, New York.

Wright, D.G. (1970) *Democracy and Reform 1815-1885*, Longman, London.

5232 | 9

Date Due

SEP 02 1997

MAY 31 1998

Lib-26-67